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Osborn and C. W. Mally; 'Anatomy of *Sphærium sulcatum*,' by Gilman Drew; 'Fungus Diseases of Plants at Ames,' by L. H. Pammel and G. W. Carver; 'Notes on the Remains of *Elephas* and *Mastodon*,' by S. W. Beyer.

These papers will, with few exceptions, appear in the Academy proceedings which will be issued at as early a date as possible. The Academy is in a very flourishing condition, having now something over one hundred members. Its proceedings are published by the State and it is incorporated under State law. Its library and exchanges have grown rapidly in recent years, and there is every season to believe it will have a decided influence in advancing the cause of scientific research in the State.

The following officers were elected for the coming year: President, T. Proctor Hall; 1st Vice-President, W. S. Franklin; 2d Vice-President, T. H. Macbride; Secretary and Treasurer, Herbert Osborn; Additional members of the Executive Committee, W. S. Hendrixson, M. F. Arey, W. H. Norton.

HERBERT OSBORN,
Secretary.

CALIFORNIA SCIENCE ASSOCIATION.

THE second annual meeting of the California Science Association was held in Oakland, January 3 and 4, 1896. President Jordan, of Stanford University, delivered the annual address as President of the Association on 'The Foundation of Belief.'

The following list of papers was read:

1. *A Memoir of Dana*: JOSEPH LE CONTE.
2. *The Action of Anhydrous Ammonia and Anhydrous Aluminium Chloride*: J. M. STILLMAN.
3. *A Quantitative Separation of Iodine from Chlorine*: M. ADAMS.
4. *A Plea for an Aero-Physical Observatory on Mt. Tamalpais*: A. MCADIE and W. H. HAMMON.
5. *Notes on the Accuracy of refractive Index Determinations*: D. W. MURPHY.
6. *The Manufacture of Artificial Food Products*: S. W. YOUNG.
7. *The Maintenance of Constant Temperatures*: S. W. YOUNG.
8. *A Modification of the Bunsen Ice Calorimeter*: F. SANFORD.
9. *A Relief Map of California*: N. F. DRAKE.
10. *A Relief Map of Oregon*: S. SHEDD.
11. *Some Lecture Experiments in Chemistry*: W. B. RISING.
12. *On Micro-chemical Analysis*: W. B. RISING.
13. *Use of Hydro-bromic Acid in the Estimation of Mercury and Cinnabar*: W. B. RISING and V. LENHER.
14. *Chemical Behavior of Liquid Hydroiodic Acid*: F. G. COTTRELL and R. S. NORRIS.
15. *The Criterion of Continuity*: IRVING STRINGHAM.
16. *Logarithmic Orthomorphosis*: IRVING STRINGHAM.
17. *The Nine-Point Rectangular Hyperbola*: A. V. SAPH.
18. *Simplification and Extension of Gauss's Third Proof of the Fundamental Theorem of Algebra*: M. W. HASKELL.
19. *Note on Fermat's Theorem*: M. W. HASKELL.
20. *Notes on the Imaginaries in Plane Coördinate Geometry*: R. L. GREEN.
21. *Note on Partial Differential Equations*: R. E. ALLARDICE.
22. *Notes toward the Life History of the 'Water Dog' or California Newt (*Diemyctylus torosus*)*: W. E. RITTER.
23. *A few Observations on the Hydroidea of San Francisco Bay, particularly concerning their Reproduction*: W. E. RITTER and H. B. TORREY.
24. *Respiration in Women*: MISS C. D. MOSHER.
25. *Effect of Variation of Temperature on Muscle Irritability*: R. L. WILBUR.
26. *Refractory Period in an Isolated Strip of Cardiac Muscle of the Turtle*: MISS E. BRIGGS.
27. *Note on the Structure of the Brain of Embryo of *Gerrhonotus**: A. B. SPAULDING.
28. *The Development of the so-called Phosphorescent Organ of *Porichthys notatus**: C. W. GREENE.
29. *Note on the Function of the Air Bladder of *Porichthys notatus**: C. W. GREENE.
30. *Latitude and Vertebræ in Fishes*: D. S. JORDAN.
31. *Distribution of Trout in California*: D. S. JORDAN.
32. *Some points in Plant Geography*: E. W. HILGARD.
33. *A New California Liverwort*: D. H. CAMPBELL.
34. *Some Facts concerning California Tunicata*: F. W. BANCROFT and W. E. RITTER.
35. *The Mallophaga*: V. L. KELLOGG.
36. *Explorations of the U. S. Fish Commission in 1895*: O. P. JENKINS.
37. *A new form of Microtome*: O. P. JENKINS.

The officers elected for the ensuing year are: Chas. H. Keyes, *President*; Irving

Stringham and Fernando Sanford, *Vice-Presidents*; M. W. Haskell, *Secretary*; R. L. Green, *Treasurer*; John D. Parker, *Custodian*. These, with the former Presidents, Joseph Le Conte and David Starr Jordan, constitute the Executive Committee.

The next meeting will be held at the State University in Berkeley.

M. W. HASKELL,
Secretary.

CURRENT NOTES ON PHYSIOGRAPHY.

ANNUAL RANGE OF TEMPERATURE OF THE OCEAN SURFACE.

THE annual range of temperature in the lower atmosphere, first clearly charted by Supan (*Zeitschr. für wissensch. Geogr.*, 1880) and more recently by Conolly (see my *Elementary Meteorology*, fig. 18), is recognized as an important climatic factor, and the distribution of its larger and smaller values brings forward several interesting physiographical generalizations. Dr. G. Schott now presents a similar chart for the annual range of temperature of the ocean surface (*Pet. Mitt.*, July, 1895,) from which it appears that the maximum range, 15° to 20° C., occurs on latitude 40° N., next east of the continents. Belts of large range, 5° to 7° in the southern hemisphere, 8° to 12° in the northern hemisphere, run around the oceanic world about 38° north and south, that is, under the belt of high atmosphere pressure and prevailing clear skies; and small ranges are generally found around the equator, 1° to 3° , and in high latitudes, 2° in the far southern ocean, 4° to 6° in the far north. Dr. Schott ascribes the maximum ranges to the oscillation of cold and warm currents; and to this the contrast between the off-shore winds of summer and winter, by Nova Scotia and Corea, may fairly be added. Locally increased ranges on the equator, up to 5° or 6° , west of Africa and South America, are explained by the weaker and stronger flow of the

South Atlantic and South Pacific eddies in the southern summer and winter.

WINDS OF THE PACIFIC OCEAN.

THE mean strength of the winds over the Pacific Ocean is discussed by Köppen in the *Annalen der Hydrographie* (July and August, 1895), in preparation for the publication of a *Segelhandbuch*. The velocities, without regard to directions, are presented in tabular form and in charts for the opposite seasons of January–February and July–August. Apart from the practical value of these results to navigation, they present interesting features characteristic of the planetary and terrestrial schemes of atmospheric circulation. Where the material is most plentiful, one may easily recognize the weak winds and calms of the planetary system around the equator, between the steady trades on either side; the frequency of calms again, but also of stronger winds in the horse latitudes, about 30° north and south; and the rapid increase of strong winds in the higher latitudes of the prevailing westerlies. Terrestrial features appear in the annual migration of these wind belts, not however symmetrically about the equator, but about a medial line in perhaps 5° north latitude; and also in the seasonal variation of the strength of the westerlies, from over 4 (Beaufort scale) in summer to over 5 in winter in the northern temperate zone, from over 5 to over 6 in the far southern zone. The irregularities of the planetary belts and of the terrestrial migrations may, in great part, be plausibly referred to cyclonic disturbances, but need much further investigation. The light equatorial winds shift south of the equator only near Australia, where monsoon winds and a seasonal counter current may be searched for.

ABNORMAL AND SOLITARY WAVES.

REPORTS are not infrequently made of waves or 'seas' of exceptional size, erro-